The brachial artery-brachial vein fistula: Expanding the possibilities for autogenous fistulae

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Objective: **The National Kidney Foundation Dialysis Outcomes and Quality Initiative recommends autogenous access for new dialysis procedures. The patient requiring hemodialysis with inadequate superficial arm veins represents a formidable challenge to the surgeon. Our objective is to describe results with an alternative access procedure, the autogenous brachial-brachial artery (ABBA) access in patients with inadequate superficial arm veins.**
Methods: **One surgeon created 163 new dialysis accesses in 122 patients during 40 consecutive months at a university hospital. There was 97% patient follow-up. All patent but diminutive superficial arm veins as judged by preoperative ultrasound were explored. Arms with inadequate veins at exploration or arms with thrombosed veins on ultrasound received either prosthetic or ABBA procedures. Upper-arm access was often staged, involving a second "superficialization" procedure. This is a retrospective case series based on a comprehensive medical record review. Cox proportional hazards models were used to compare access patency for individual as well as multiple factors suspected or known to influence dialysis access outcomes. Society for Vascular Surgery reporting guidelines were used except where specifically noted and justified otherwise.**
Results: **One hundred thirty-five autogenous and 28 prosthetic dialysis operations were performed. Primary patency for all access procedures at 12, 24, and 36 months was 58%, 50%, and 38%, respectively. Primary assisted patency for all access procedures at 12, 24, and 36 months was 97%, 91%, and 85%, respectively. Secondary patency at 12, 24, and 36 months was 99%, 97%, and 97%, respectively. Finally, functional patency at 12, 24, and 36 months was 71%, 67%, and 44.0%, respectively. Of the 122 patients, 70 patients received either ABBA or prosthetic access. ABBA out-performed prosthetic access in terms of primary patency (hazard ratio for prosthetic vs ABBA: 4.21 (95% confidence interval [CI]: 1.49, 11.91) and functional patency (hazard ratio for prosthetic vs ABBA: 6.27 95% CI: 1.24-31.72) in patients referred early. Functional patency was more likely to be compromised in elderly patients and in patients with hypercoagulable diagnoses.**
Conclusions: **Autogenous brachial-brachial access for dialysis out-performed prosthetic access with respect to primary and functional patency in patients referred early without differences in overall complications. (J Vasc Surg 2008;48: 1245-50.)**

End-stage renal disease (ESRD) continues to exact a major and unrelenting cost to the United States in terms of financial and human resources. The incidence of ESRD is roughly 339 per million, according to the latest data available from the US Renal Data System.[1] Between 1999 and 2001, vascular access maintenance procedures increased by 22% and resulted in the hospitalization of 20% of patients with end-stage renal disease.[1] The National Kidney Foundation Dialysis Outcome Quality Initiative (NKF-DOQI), in an attempt to provide some coherent and uniform guidelines for dialysis access creation, has championed the use of autogenous fistulae, due to the dismal patency rates for prosthetic grafts.[2] In modern practice, the presence of an "adequate" superficial vein such as the cephalic or basilic vein, either in forearm or in the upper arm, should lead to the creation on an autogenous arteriovenous fistula. If adequate superficial veins are not present, then typically a prosthetic arteriovenous graft is inserted. We have previously reported on an alternative option for the creation of an autogenous fistula, wherein an adequately sized brachial vein is anastomosed to the brachial artery and then subsequently transposed to a more superficial position.[3] This report describes a more extensive experience and follow-up with this technique in the context of all dialysis access operations at an academic hospital in the era of DOQI.

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METHODS

A retrospective review of all dialysis access operations performed by a single surgeon from October 2003 to February 2007 was conducted by analyzing all relevant operative reports, imaging studies, and clinical follow-up. The University of California, San Diego (UCSD) Institutional Review Board (IRB) approval was obtained. An intent-to-treat analysis was employed such that no patients, other than those lost to follow-up, were excluded from the analysis with the following exception; one access for one patient was excluded because it became patent the same day. It should be noted that UCSD has its own dialysis center and as such close follow-up was facilitated. All patients were followed in the vascular surgery clinic until access maturation and thereafter in the dialysis unit.

In addition to a physical examination, duplex ultrasound vein mapping was a fundamental component in determining the suitability of the superficial veins for access surgery. The two vascular laboratories used in this study have similar protocols for the imaging of upper extremity veins for mapping. The cephalic and brachial veins are imaged from the wrist to the axilla; the patency and diameters are evaluated at the wrist, the forearm, the antecubitus, above the elbow, and the upper arm. Until recently, the brachial veins were not routinely imaged but because of this experience, we have recently begun to study the brachial veins in light of our use of the ABBA. Veins were assessed for diameter, patency, compressibility, and wall thickening.

Access patency was defined not merely by presence of flow but rather in terms of functional patency, which is the ability to obtain adequate dialysis using the access. Primary, assisted primary, and secondary patency were defined by loss of a palpable thrill or fistula thrombosis on imaging. Functional patency reflects the time from the first successful cannulation until inability of the access to provide adequate dialysis. Early referral refers to referral at least 3 months before the need for dialysis or creatinine level <4 mg/dL as adopted by the Committee on Reporting Standards for Arterio-Venous Accesses of the Society of Vascular Surgery.[4] DOQI criteria and complications are reported according to published standards and are similarly graded on a 0-3 severity scale.[4] Patients were deemed lost to follow-up only if they received dialysis access surgery and failed postoperative clinic visits. Surgical follow-up intervals were individualized but always included a visit 1-week postoperatively and continued until the access was deemed mature. Nephrology follow-up continued thereafter, which always included a physical examination of dialysis accesses.

Autogenous brachial vein-brachial artery (ABBA) technique. In our practice, vein mapping dictates which vein in which arm will be used for the construction of the access. When suitable superficial veins were identified on ultrasound or at operation, the access procedures described in Table I were created. If on ultrasound vein mapping or at time of operation, no superficial vein of suitable quality or diameter were present, then the brachial veins in the antecubital fossa were examined. If the vein(s) were at least 2.5 mm or larger, then it was used for a brachial vein to brachial artery anastomosis. Most of the time, the outflow vein used for access was tested by infusing heparinized saline to exclude any proximal obstruction and importantly, a series of dilators were passed into the vein to corroborate size and patency. A suitable vein had to accommodate at least a 2.5 mm dilator in order to be used for an access procedure.

The technique for creation of the staged ABBA was previously described in detail.[4] Both stages are routinely performed under local anesthesia with intravenous sedation or with a regional block. Briefly, a transverse incision one finger-breadth below the antecubital crease is performed in an effort to identify suitable brachio-cephalic/basilic veins. In the absence of such veins, the brachial artery is exposed under the bicipital aponeurosis along with the medial brachial vein (or largest suitable brachial vein). An end-to-side ABBA anastomosis is performed with running 7-0 polypropylene suture. The second stage of the operation proceeds approximately 6 weeks later and involves mobilization of the brachial vein with division of draining tributaries and "superficialization" of the vein into a subcutaneous channel in the medial upper arm. The fistula is examined closely in clinic postoperatively and is typically ready for cannulation after 4 to 6 weeks after the second superficialization procedure.

Table I. Location of access procedures (n = 163)

Location	*Wrist*	*Upper arm*	*Forearm*	*Lower extremity*	*Total*
ABBA	0	42	0	0	42
Other Autogenous	19	21	53	0	93
Prosthetic	0	16	10	2	28
Total	19	79	63	2	163

ABBA, Autogenous brachial vein-brachial artery.

Statistics. Differences in primary, assisted primary, secondary, and functional patency were analyzed using Cox proportional hazards models.[5] A shared frailty component was used to account for the fact that many patients had multiple procedures.[6] Analyses showed though that the frailty component was not statistically significant in any of the models, thus modeling proceeded with the standard Cox model. For the analysis of assisted primary patency an observation was considered censored at the time of primary patency for patients without subsequent interventions. For the analysis of secondary patency, an observation was considered censored at the time of primary or assisted primary patency for patients without a secondary procedure. Patients with secondary patency but without an assisted patency were excluded from the analysis of secondary patency. An access is said to be "functional" when it is able to deliver a flow rate of 350 to 400 mL/min without access recirculation to maintain a treatment time less than 4 hours in accordance with SVS reporting standards.[4] In models including patients with a hypercoagulable state, this definition was limited to patients with protein C or S deficiencies, factor V Leiden mutations, or antiphospholipid syndrome. Factors that were associated with patency at a level of $\alpha = 0.25$ in univariate analyses were considered for inclusion in multivariable models. Factors (other than procedure type) with a *P* value larger than .05 were successively excluded from multivariate models. Fractional polynomials were used to assess the linearity assumption (on the log scale) of continuous covariates. The proportional hazards assumption was assessed using the test by Grambsch and Therneau[6] and score residuals[7] were used to assess the influence of individual observations on estimated parameters. For models with at least one continuous covariate, goodness-of-fit was also checked using the Grønnesby and Borgan test.[8] Multivariable models were only performed for primary patency and functional patency, because the number of events were too small for multivariable models for assisted primary and secondary patency (n = 7 and 2, respec-

Table II. Patient characteristics (n = 122)

Characteristic	*Summary statistic n (%) unless indicated otherwise*
Age*	
Mean	55.4
Range	13-91
Gender	
Male	64 (52%)
Female	58 (48%)
Race	
White	59 (48%)
Hispanic	34 (28%)
African American	15 (12%)
Other	14 (11%)
Indication	
Chronic	103 (84%)
Awaiting transplant	19 (16%)
Early referral	
No	47 (39%)
Yes	75 (61%)
Etiology	
Hypertension	51 (42%)
Diabetes mellitus	22 (18%)
Glomerulonephritis	10 (8%)
Other	39 (32%)
Organ transplant	
No	104 (85%)
Yes	18 (15%)
Transplant related (N = 18)	7 (39%)
Comorbidities	
Diabetes mellitus	62 (51%)
Hypertension	103 (84%)
Congestive heart failure	15 (12%)
Hyperlipidemia	42 (34%)
Atrial fibrillation	8 (7%)
Hypercoagulable state	12 (10%)

tively). Finally, χ^2 tests where used for comparisons of complications by procedure type if all cells had an expected value of at least five and Fisher exact tests were used if any cell had an expected value less than five. For these comparisons Hochberg adjustments were used to account for multiple comparisons. *P* values were not adjusted for multiple comparisons. Statistical analyses were performed using state version 10.0 (Stata Statistical Software, Release 10, StataCorp, College Station, Tex).

RESULTS

Patients and techniques. A total of 122 patients received 163 new vascular accesses resulting in 135 (83%) autogenous and 28 (17%) prosthetic shunts. Thirty-nine percent and 49% of procedures were forearm and upper-arm access operations, respectively; only 12% of operations were performed using wrist veins (Table I). Four patients were lost to follow-up prior to access maturation or evaluation and excluded from all analysis. Eighty-two percent of procedures (including superficialization procedures) were performed under local anesthesia with intravenous sedation. Patient demographics and comorbidity data are reported in Table II. Mean patient age was 55.4 and 48% of patients were female. As expected, the most common etiologies of renal failure were hypertension and diabetes mellitus.

Outcome analysis. Patency rates are reported in Table III. Primary patency for all access procedures at 12, 24, and 36 months was 58%, 50%, and 38%, respectively. Primary assisted patency for all access procedures at 12, 24, and 36 months was 97%, 91%, and 85%, respectively. Secondary patency at 12, 24, and 36 months was 99%, 97%, and 97%, respectively. Finally, functional patency at 12, 24, and 36 months was 71%, 67%, and 44.0%, respectively. Twenty-one (13%) patients required a single new access, 7 (4%) required two additional accesses, and 2 (1%) patients required three or more new accesses.

Kaplan-Meier curves applied to primary and functional patency rates are presented in the Fig. Inclusion of standard errors of Kaplan-Meier estimates is recommended by SVS guidelines.[4] (Appendix, online only) These are not presented in the Fig because of the necessity of presenting multiple estimates due to the significant interaction between procedure type and early referral. Evident from the patency analysis is the superiority of ABBA over prosthetic access for patients who were referred early. Cox hazard ratios indicate that primary patency was significantly prolonged (hazard ratio for prosthetic vs ABBA: 4.21, 95% confidence interval [CI]: 1.49, 11.91) in patients with ABBA procedures compared to prosthetic procedure within the group of patients who were referred early (Table IV). There was no difference between ABBA and prosthetic access among patients not referred early (hazard ratio for prosthetic vs ABBA: 1.04, 95% CI: 0.39, 2.79). There were no statistically significant differences in primary patency rates between ABBA and other autogenous access. Univariate analyses of assisted patency showed no significant differences between procedure type for primary, assisted primary and functional patency, but assisted primary patency was significantly longer if referred early and significantly shorter if atrial fibrillation was present. As for functional patency, the relative risk of access failure was larger for patients with a prosthetic procedure compared with patients with ABBA (hazard ratio for prosthetic vs ABBA: 6.27, 95% CI: 1.24-31.72) within the group of patients referred early (Table IV). Although not statistically significant, functional patency appeared to be shorter for ABBA compared with prosthetic procedures if referred early. Finally, in the model for functional patency, advanced age and hypercoagulable conditions resulted in significantly increased risk, a 33% increase in risk for each additional 10 years in age (95% CI: 1.08, 1.63) and a 3.99-fold increase for the presence of a hypercoagulable diagnosis (95% CI: 1.66, 9.02). There were no statistically significant differences in functional patency rates between ABBA and other autogenous access.

The 30-day mortality was 0%. There was a total of 83 complications reported for 75 procedures and for 88 procedures no complications were reported. Venous hypertension occurred in one ABBA access, none of the patients receiving prosthetic access, and in four other autogenous accesses. When comparing complications by procedure

Table III. Number at risk, percent patent, and standard error (Greenwood formula) at 0, 6, 12, 18, 24, 30, and 36 months

	Months						
	0	*6*	*12*	*18*	*24*	*30*	*36*
Primary patency							
ABBA	42	28	18	10	5	4	2
Other autogenous	93	62	41	26	16	9	2
Prosthetic	28	10	5	0	0	0	0
Percent patent	100	68	58	52	50	38	38
Standard error		0.037	0.041	0.45	0.047	0.065	0.065
Assisted primary patency							
ABBA	42	28	20	13	8	7	5
Other autogenous	90	62	46	31	19	12	4
Prosthetic	26	10	5	1	1	0	0
Percent patent	100	99	97	97	91	91	85
Standard error		0.007	0.019	0.019	0.044	0.044	0.075
Secondary patency							
ABBA	42	28	20	13	8	7	5
Other autogenous	93	64	47	31	19	12	4
Prosthetic	28	12	6	2	1	0	0
Percent patent	100	99	99	97	97	97	97
Standard error		0.007	0.007	0.019	0.019	0.019	0.019
Functional patency							
ABBA	38	23	18	10	8	4	1
Other autogenous	80	55	39	22	16	8	4
Prosthetic	25	8	3	2	1	0	0
Percent patent	100	73	71	70	67	55	44
Standard error		0.038	0.039	0.041	0.048	0.075	0.115

ABBA, Autogenous brachial artery-brachial vein fistula.

type overall and separately by whether or not early referral occurred, there were no statistically significant differences between the procedures. All patients with this complication had a history of either in-dwelling pacemaker leads or multiple previous central venous catheters resulting in severe central venous stenosis. There were three patients with access-related hand ischemia which resolved without the need for remedial operation (Table V). Finally, three ABBA procedures showed inadequate maturation (7.5%) and required conversion to a prosthetic graft.

DISCUSSION

The era of the NKF-DOQI began in late 1990s marked by an increased awareness of dialysis access underperformance and prosthetic graft over-utilization. Current DOQI recommendations are for a 65% prevalent functional arteriovenous fistula (AVF) rate.[1] We have herein described a relatively large case series of patients with medium-term follow-up who received the autogenous brachial-brachial fistula due to a lack of usable superficial arm veins in the era of DOQI. Follow-up was 97%. All operations were supervised by a single attending surgeon, which limits the variability of many large case series, but also limits generalizability. Inspection of the Fig reveals that the ABBA patency curve is similar to the patency rate of the other autogenous fistulae when early referral was possible. Reluctance to perform the ABBA procedure might result from the possibility that arterializing the brachial vein would result in access-related hand ischemia and venous hypertension. Martin et al reported in 2000 on 15 patients with brachial arteriovenous fistula with close imaging follow-up.[9] They found that brachial artery flows increased to 700 mls/min postoperatively and fistula flows greater than 400 mls/min at 2 weeks predicted success. Finally, Martin et al reported reductions in exercise induced digital arterial pressures and hand claudication was present in 26% of patients. While we specifically did not perform exercise digital arterial pressures, hand claudication has not been an issue in our experience.

Patients with impaired functional patency were more likely to be older, and this is especially worth noting as others have published that the success rate of dialysis access surgery may be inferior in the elderly patient. Indeed, Rao et al reported a series of 56 patients who received basilic vein transpositions and found that age greater than 60 was associated with poorer maturation and patency.[10] Diminished functional patency was also observed in patients with the diagnosis of a hypercoagulable condition. A number of other authors have reported on the rate of early and recurrent thromboses that plagues these patients.[11,12]

The first modern description of the transposed brachial vein fistula was by Bazan et al in 2004.[13] They described two patients with inadequate superficial arm veins who received a similar transposition of the brachial vein, tolerated the reconstruction without access-related hand ischemia or other complications, and successfully received hemodialysis during their 1 year of follow-up. Recently, Dorobantu et al reported their experience with 33 attempts at the autogenous brachial-brachial fistula.[14] A total of

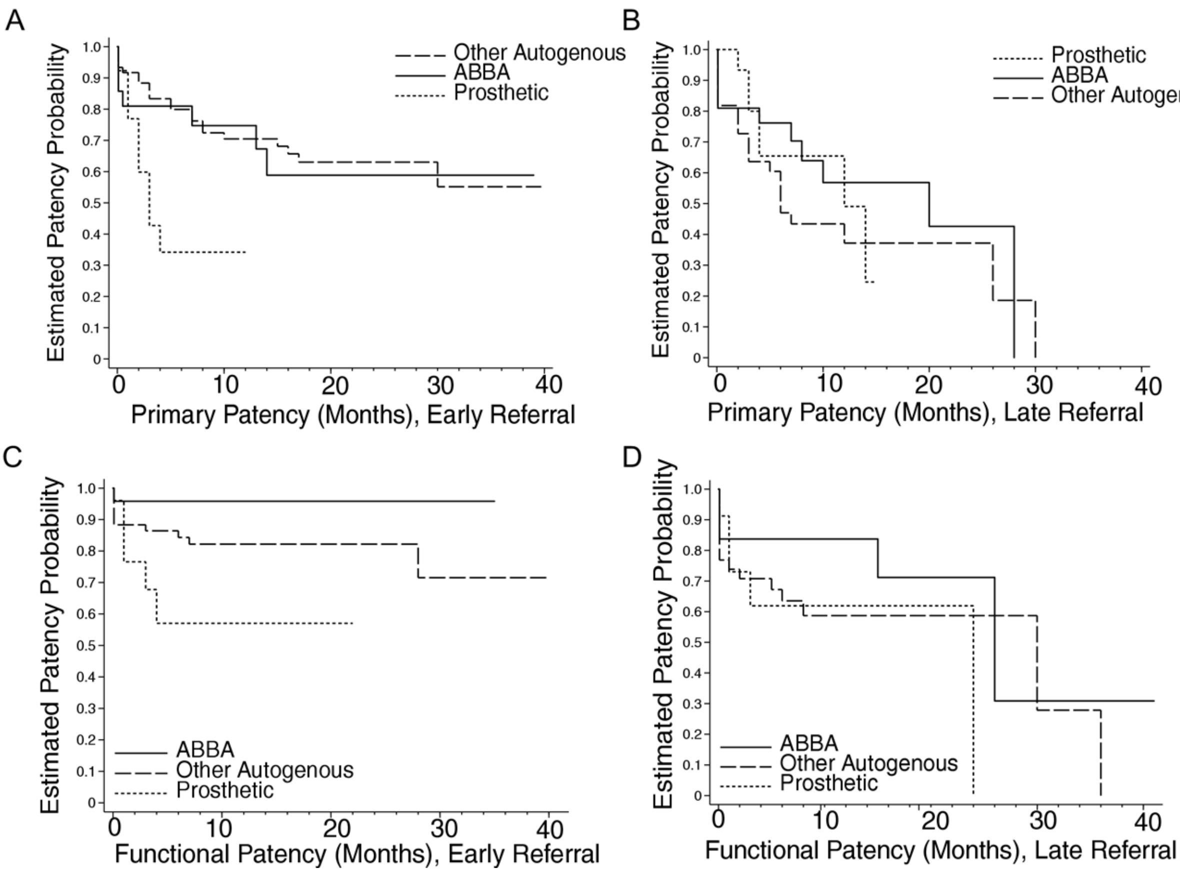

Fig. Kaplan-Meier analysis of primary and functional access patency.

Table IV. Hazard ratios and 95% confidence intervals for type of prodedure by referral status

Early referral	*Other autogenous vs ABBA*	*Prosthetic vs ABBA*
Primary patency		
No	1.53 (0.71, 3.30)	1.04 (0.39, 2.79)
Yes	1.08 (0.45, 2.55)	4.21 (1.49, 11.91)
Functional patency*		
No	1.59 (0.63, 4.03)	0.65 (0.19, 2.16)
Yes	2.86 (0.62, 13.22)	6.27 (1.24, 31.72)

ABBA, Autogenous brachial vein-brachial artery.
*Adjusted for age and hypercoagulable state.

18.8% of their fistulae failed to reach maturity and mean follow-up was 14 months with a patency of 85.2% in line with our results. In contrast to our results, they noted arm edema in at least one-third of patients.

In a recent series reported by Woo et al, 190 patients underwent transposed autogenous upper-arm fistulae concurrent to 166 prosthetic procedures.[15] Illustrating the importance of "fistula first," the 5-year secondary patency for the transposed autogenous and prosthetic groups were 57% and 17%, respectively. In the absence of usable cephalic/basilic veins, we proceed with the autogenous brachial vein-brachial artery access which has allowed our center to achieve a prevalent functional fistula rate at 24 months of 67%, exceeding the recommendations of 65% set forth in DOQI guidelines.

Table V. Complications by fistula type (n = 163)

Type	*ABBA*	*Other autogenous*	*Prosthetic*	*Total*
Bleeding	1	1	0	2
Infection	0	1	1	2
Non-infectious fluid collections	0	1	2	3
Anastomotic complications	4	8	1	13
Mid-AV access/runoff complications	1	1	0	2
Access thrombosis	4	16	9	29
AV access malfunction	8	12	4	24
Access-related hand ischemia	1	0	1	2
Venous hypertension	1	4	0	5
Miscellaneous	0	1	0	1

ABBA, Autogenous brachial vein-brachial artery; *AV,* arterio-venous fistula.

Because the methodology of this report involved neither a prospective design nor blinded randomization, caution has to obviously be exercised in the interpretation of the data. For instance, internal bias does exist when patients undergo multiple operations and thus induce correlated observations. Our analyses showed that such correlation appears not to be statistically significant, but the potential for bias remains. It is also possible that surgeon bias in the analysis of complications and other less definable factors contribute to the choice of operations performed. Finally, it should be emphasized that our statistical analysis could only distinguish a benefit of ABBA in patients referred greater than 3 months before the need for dialysis. It is difficult to determine the reason for a nondifferential effect for primary patency if early referral was not achieved (Table IV).

A tailored approach for dialysis access surgery is critical; we approach the majority of patients with inadequate superficial arm veins in a similar fashion. When upon exploration of the antecubital fossa, a superficial vein fistula appears not feasible, the biceps aponeurosis is opened and the brachial veins inspected. At this point, if the vein is of adequate diameter, an autogenous fistula is created. We prefer to then allow for maturation of the vein for 6 weeks or so before the superficialization is performed. If at that exploration, the maturation is unsatisfactory, then a prosthetic arteriovenous graft is placed. An important point is that the brachial vein can be interrogated preoperatively on duplex, but exploration almost always results in a useable brachial vein for ABBA.

CONCLUSIONS

With ever improving results with renal replacement therapy to sustain the lives of both the young and the elderly afflicted with renal disease, hemodialysis access must be durable. It is appears that autogenous accesses outperform prosthetic grafts in patients referred early. We report here that, in the absence of superficial arm veins, the autogenous brachial-brachial access performs as well as other autogenous accesses and is superior to prosthetic access if patients are referred early. Given that currently, the absence of superficial veins for autogenous access, including a transposable basilic vein, leads to the insertion of a prosthetic graft, we would suggest that incorporation of the ABBA into practice would provide yet one more potential option for autogenous access, which, in this study, has superior patency rates compared with prosthetic access, and equivalent patency rates to conventional autogenous access procedures in this patient cohort. Further research is necessary to determine whether these results can be validated in settings where multiple surgeons perform the procedures and to investigate further differences between the procedures in patients referred later than desired.

AUTHOR CONTRIBUTIONS

Conception and design: JG, AS, NA
Analysis and interpretation: JG, SM, AS, NA
Data collection: JG, AS
Writing the article: JG, SM
Critical revision of the article: JG, SM, AS, NA
Final approval of the article: JG, SM, AS, NA
Statistical analysis: JG, SM
Obtained funding: Not applicable
Overall responsibility: JG, NA

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Additional material for this article may be found online at www.jvascsurg.org.

Appendix, online only.

id	identification number (anonymized)
ttpp	time to primary patency
censorpp	censoring indicator (1=event)
ttapp	time to assisted primary patency
censorapp	censoring indicator (1=event)
ttsp	time to secondary patency
censorsp	censoring indicator (1=event)
ttfp	time to functional patency
censorfp	censoring indicator (1=event)
type3cat	Type of procedure
doqi	Early referral (1=yes, 0=no)
age	Age at procedure start
hs	hypercoagulable state

id,ttpp,censorpp,ttapp,censorapp,ttsp,censorsp,ttfp,censorfp, type3cat,doqi,age,hs
1,24,0,24,0,24,0,40,0,“OthAuto”,1,42,0
2,36,0,36,0,36,0,34,0,“ABBA”,1,66,0
3,9,0,9,0,9,0,7,0,“OthAuto”,0,59,0
4,14,0,14,0,14,0,12,0,“OthAuto”,1,54,0
5,.1,1,.1,0,.1,0,.1,1,“OthAuto”,0,34,1
6,5,1,5,0,5,0,0,1,“OthAuto”,1,49,1
7,28,0,28,0,28,0,25,0,“OthAuto”,1,36,0
8,40,0,40,0,40,0,39,0,“OthAuto”,1,44,0
8,3,1,3,0,3,0,0,1,“OthAuto”,1,44,0
9,4,1,4,0,4,0,1,1,“Prosth”,0,91,0
10,7,0,7,0,7,0,5,0,“Prosth”,1,73,0
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17,7,1,9,0,9,0,7,0,“OthAuto”,0,43,0
18,15,0,15,0,15,0,13,0,“OthAuto”,1,35,1
19,19,0,19,0,19,0,16,0,“OthAuto”,1,80,0
20,.1,1,.1,0,.1,0,.1,1,“ABBA”,0,56,0
20,4,0,4,0,4,0,2,0,“ABBA”,0,56,0
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22,6,1,8,1,8,0,6,1,“OthAuto”,0,70,0
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23,.1,1,.1,0,.1,0,5,1,“OthAuto”,0,66,0
24,9,0,9,0,9,0,8,0,“Prosth”,0,55,1
24,.1,1,.1,0,.1,0,.1,1,“ABBA”,0,55,1
25,10,1,,,8,0,7,0,“OthAuto”,1,43,1
25,.1,1,.1,0,.1,0,.1,1,“Prosth”,1,42,1
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25,.1,1,.1,0,.1,0,.1,1,“OthAuto”,1,42,1
26,11,0,11,0,11,0,7,0,“ABBA”,1,60,1
27,3,1,3,0,3,0,.1,1,“OthAuto”,0,34,0
28,14,1,40,0,40,0,26,0,“ABBA”,1,71,0
29,15,1,16,0,16,0,9,0,“OthAuto”,1,34,0
30,5,0,5,0,5,0,3,0,“ABBA”,0,73,0
31,37,0,37,0,37,0,32,0,“OthAuto”,1,36,0
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33,2,1,2,0,2,0,1,1,“Prosth”,0,65,0
34,21,0,21,0,21,0,19,0,“OthAuto”,1,74,0
35,18,0,18,0,18,0,16,0,“ABBA”,0,83,0
36,20,1,40,0,40,0,41,0,“ABBA”,0,25,0
37,4,0,4,0,4,0,2,0,“OthAuto”,0,32,0

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38,10,0,10,0,10,0,8,0,“OthAuto”,1,40,0
38,7,1,7,0,7,0,0,1,“OthAuto”,1,40,0
39,18,0,18,0,18,0,12,0,“OthAuto”,1,52,0
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41,7,0,7,0,7,0,5,0,“OthAuto”,1,75,0
42,30,1,30,0,30,0,28,0,“OthAuto”,0,51,0
43,19,0,19,0,19,0,,,“OthAuto”,1,72,0
44,20,0,20,0,20,0,19,0,“ABBA”,1,54,0
45,30,0,30,0,30,0,28,0,“OthAuto”,1,63,0
46,15,0,15,0,15,0,14,0,“Prosth”,0,41,0
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48,12,0,12,0,12,0,10,0,“OthAuto”,1,40,0
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52,16,0,16,0,16,0,13,0,“OthAuto”,1,13,0
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54,8,0,8,0,8,0,6,0,“OthAuto”,1,61,0
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82,1,1,1,0,1,0,0,1,“Prosth”,1,37,0
83,39,0,39,0,39,0,35,0,“ABBA”,1,39,0
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87,30,0,30,0,30,0,27,0,“OthAuto”,1,50,0
88,17,1,19,0,19,0,15,0,“OthAuto”,1,17,0

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89,5,0,5,0,5,0,3,0,“ABBA”,0,60,0
90,25,0,25,0,25,0,23,0,“OthAuto”,1,59,0
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91,14,1,24,1,24,0,24,1,“Prosth”,0,59,0
92,4,0,4,0,4,0,2,0,“OthAuto”,1,68,0
92,3,1,3,0,3,0,1,1,“Prosth”,1,70,0
92,30,1,30,0,30,0,28,1,“OthAuto”,1,68,0
93,15,0,15,0,15,0,13,0,“ABBA”,0,41,0
93,15,0,15,0,15,0,13,0,“ABBA”,0,25,0
94,17,0,17,0,17,0,12,0,“OthAuto”,1,46,0
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98,15,0,15,0,15,0,13,0,“ABBA”,0,36,0
99,3,1,,,7,0,4,0,“Prosth”,0,54,0
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101,5,0,5,0,5,0,,,“OthAuto”,1,59,0
102,1,1,,,22,0,22,0,“Prosth”,1,32,0
103,16,0,16,0,16,0,14,0,“OthAuto”,0,38,0
104,13,0,13,0,13,0,9,0,“ABBA”,1,43,1

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105,10,0,10,0,10,0,8,0,“ABBA”,1,30,0
106,10,0,10,0,10,0,,,“OthAuto”,1,67,0
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114,10,1,19,1,19,0,15,1,“ABBA”,0,52,0
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116,2,1,2,0,2,0,.1,1,“OthAuto”,1,66,0
117,6,1,17,0,17,0,13,0,“OthAuto”,0,58,0
118,33,0,33,0,33,0,31,0,“ABBA”,1,60,0
119,6,0,6,0,6,0,3,0,“OthAuto”,1,66,0
120,20,0,20,0,20,0,18,0,“OthAuto”,1,54,0
121,6,0,6,0,6,0,1,0,“ABBA”,1,41,0
122,.1,1,.1,0,.1,0,.1,1,“ABBA”,0,74,1
122,12,0,12,0,12,0,11,0,“Prosth”,0,74,1